



# A NEW ERA OF LCOE

Black & Veatch Confirms 210mm Vertex 600W+ PV Modules Cut CAPEX and BOS



## The Race to the Lowest LCOE

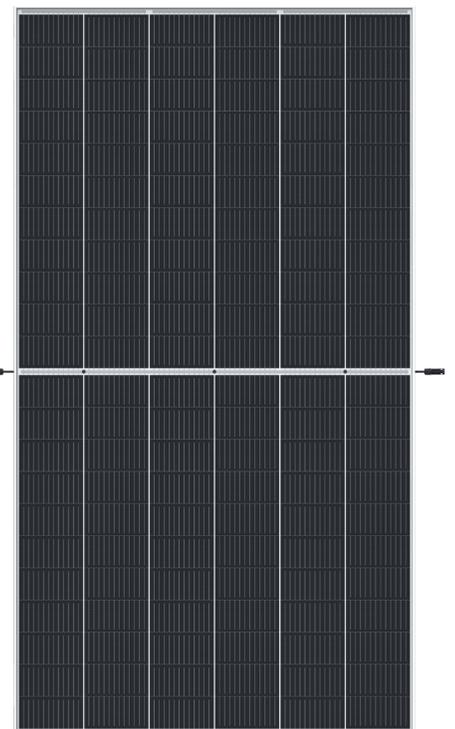
Solar levelized cost of electricity (LCOE) has dramatically declined over the last decade. Utility-scale PV LCOE dropped 85% between 2010 and 2020, roughly 17% annually. The trend continues as solar energy becomes even more cost-competitive with other forms of energy.

Deploying higher-wattage modules is the easiest way to improve LCOE. However, not all higher-wattage solar modules can help developers and EPCs achieve the lowest LCOE. PV modules must combine higher power, efficiency, and reliability in a smart system design that cuts balance of system (BOS) and CAPEX costs.

## Black & Veatch’s LCOE Assessment of the 210 Vertex Series

Trina Solar’s innovative 210mm Vertex Series receives rigorous in-house quality control testing to ensure long-term reliability and high performance and also undergoes extensive third-party assessments.

Most recently, Black & Veatch, a global independent services provider to solar projects, completed a CAPEX and LCOE assessment, comparing the new generation of ultra-high-power Vertex modules using a 210mm wafer size (G12).

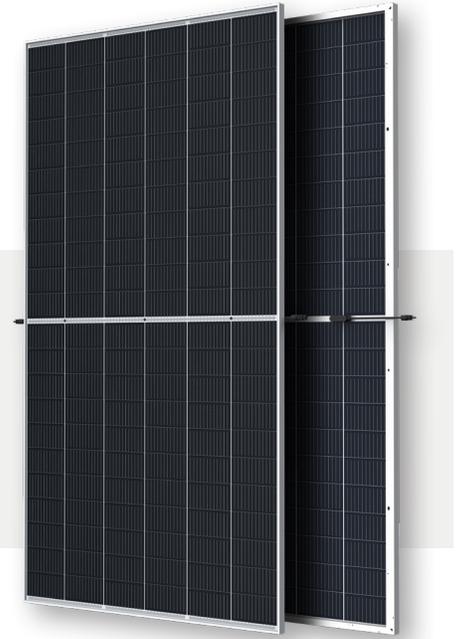


## Key Findings

- **Trina’s 660W module results in the lowest calculated LCOE** of the five modules and is \$0.61 less than the next lowest Trina 545W module.
- Compared to the 182mm 535W modules, Trina’s **210mm 660W modules reduce CAPEX up to 4.58% and lower LCOE up to 3.94%.**

## Project site & details:

- **Location:** Goodlett, Texas; US Latitude: 34.36° Longitude: -99.89°
- **Annual GHI:** 1,865 kWh/m<sup>2</sup>
- **Average temperature:** 17.5°C Project size: 100MW (AC)
- **Tracker:** Nextracker 1P tracker design
- **Ground coverage ratio (GCR):** 0.35
- **DC/AC ratio:** 1.24
- **Central Inverter Station:** Sungrow SG3600UD-MV
- Regular lot shape, flat terrain, no irregular shading.

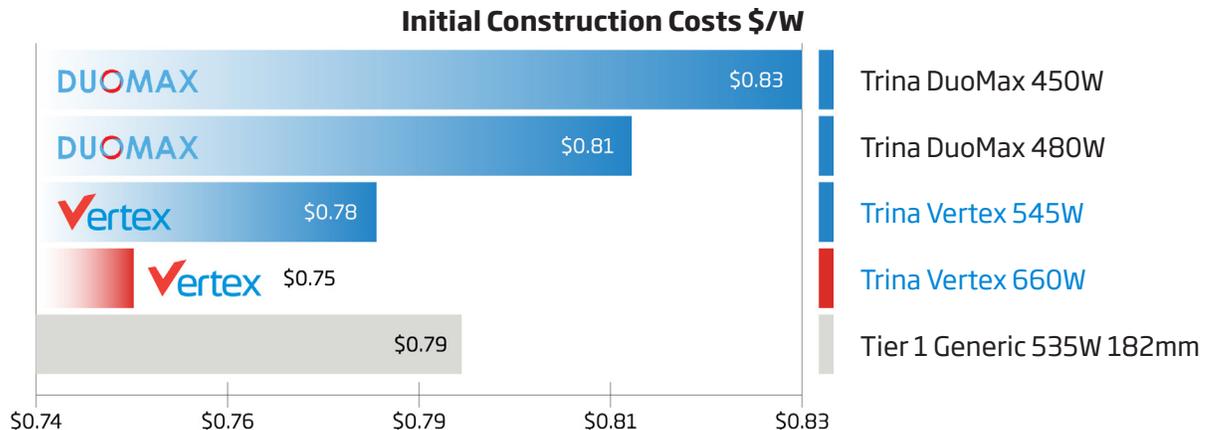
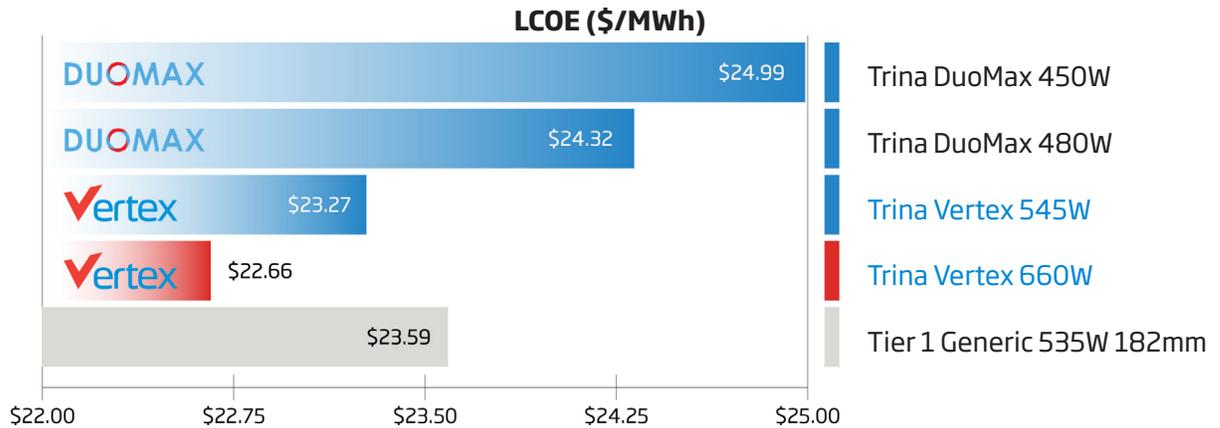


## Modules compared

- Trina DuoMaxTSM-DEG17MC.20(II) - 450W 166(M6)
- Trina DuoMaxTSM-DEG15VC.20(II) - 485W 158(G1)
- Vertex TSM-DEG19C.20 - 545W 210(G12)
- Vertex TSM-DEG21C.20 - 660W 210 (G12)
- TIER1 Module Supplier Generic 182 mm cell module - 535W 182(M10)

## Results of the Assessment:

- The resulting LCOE calculations for the five types of modules were:
  - Trina DuoMax 450W: \$24.99
  - Trina DuoMax 480W: \$24.32
  - Trina Vertex 545W: \$23.27
  - Trina Vertex 660W: \$22.66
  - Tier 1 Generic 535W 182mm: \$23.59



## Results of the Assessment Continued:

- The 660W Vertex Series:
  - Provided overall CAPEX savings of 4.6%
  - Created an overall CAPEX cost difference of \$4.5M

The primary difference in the total project costs arises from varying BoS (Balance of System) costs. While the 660W lowers costs across the board, the most significant cost reductions stem from reduced CAPEX for:

- The number of modules - The 660W Vertex needed the least number of modules for the typical plant size, requiring 44,240 fewer modules than the Tier 1 Generic 535W 182mm system and **resulting in 18.9% savings.**
- Rack & post material and installation **savings of \$843,000, or 4.5% of the project costs.**
- Indirect construction **savings of 20%.**
- BOS material and installation **savings of 21%** due to the highest power output.

Trina Solar’s innovative **high-string, low-voltage design** allows optimized module interconnection with 1500V system voltage, **boosting the string power up to 36%**. This sophisticated design can reduce electrical system costs like DC cabling and further create even more BOS and LCOE savings.

### Bottom line:

Trina Solar’s 210mm Vertex modules cut BOS and CAPEX costs and lower LCOE compared to the 535W 182mm modules. In the era of grid parity, the 210mm Vertex 600W+ series delivers the competitive advantage necessary for EPCs and project developers to boost utility-scale PV system value.

#### Appendix: About Trina Solar

From 2020 to 2021, Trina Solar launched the Vertex 210mm 410W, 510W, 555W, 605W, and 670W modules, leading the industry into the new era of 600W+. The Vertex series has been widely recognized by customers globally, opening a new channel to reduce the cost of electricity and guarantee the long-term stable returns of power plants. As the world’s leading provider of PV smart energy and energy solutions, Trina Solar is committed to bringing its product advantages into working with global partners to accelerate the global application of smart energy and create a new world of carbon-free energy.



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